Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

Terebratula aspera (Schlotheim) of the Eifel. President Haughton says, "It is therefore highly probable that the coal-beds of Melville Island are very low down in the series, and do not correspond in geological position with the coal-beds of Europe, which rest on the summit of the carboniferous beds." The coal itself in some respects resembles some of the gas-coals of Scotland, which form a system older than that of the South Welsh coals. The corals, collected apparently from the same beds, are a curious mixture of silurian and carboniferous types. "The same blending of corals has been found in Ireland, the Bas Boulonnais, and in Devonshire." He concludes by saying, "I do not believe in the lapse of a long interval of time between the silurian and carboniferous deposits,—in fact, in a Devonian period."

Mr. Lesley described the subconglomeritic or false coal measures, first recognized stratigraphically by Dr. R. M. S. Jackson in Northwestern Virginia, in 1841, and botanically by Leo Lesquereux, in 1851; the system being best developed in Wythe and Montgomery Counties in Southern Virginia, in Southeastern Kentucky, and in Nova Scotia. He considered it probable that this earlier carboniferous era, illustrated in Ireland, Scotland, and elsewhere further east by workable coal-beds, would determine the age of the Arctic coal-field. The carbonaceous slate deposit of the lowest Devonian rocks, such as have been searched for coal in Perry and Juniata Counties, Pennsylvania, and have actually yielded thin coal-seams in Western New York, may better represent the German Devonian coal-measures.

Stated Meeting, March 16, 1860.

Present, sixteen members.

President Dr. Wood, in the Chair.

Letters were read from the Oberlausitzischen Gesellschaft, dated Görlitz, Dec. 21, 1859, requesting information; from the Chicago Historical Society, dated February 29, 1860, desiring to form and sustain friendly relations with the Society; and from the Editor of the Gas Light Journal, dated New York, March 13, 1860, offering to sell a printing press, said to be the one on which Benjamin Franklin worked when a boy of fourteen years of age. On motion of Mr. Fraley, the offer was declined. On motion of Dr. Bache, the Chicago Historical Society was placed on the list of corresponding societies.

The following donations for the Library were announced:—

Reinwald's Catalog. Annuel. Vol. ii. Paris, 1859.—*From the Author.*
Bulletin Soc. Geog. Paris, xvii. Jan. to June, 1859.—*From the So.*
Robinson's Armagh Cat. of 5345 Stars. 8vo. 1859.—*From the Aut.*
Cat. of Printed Books of N. Y. Hist. S. Lib. 8vo. 1859.—*From So.*
Journal of the Franklin Institute, No. 411.—*From the Institute.*
Mayor Henry's 2d An. Mes. Phil. 1860.—*From City Councils.*
African Repository. March, 1860.—*From Amer. Col. Society.*
Saggio di Ditterologia Messicana di Luigi Bellardi. Part 1. 4to. Torino, 1859.—*From the Author.*

Mr. Lea read a letter from Dr. James Lewis, of Mohawk, N. Y., accompanied by drawings descriptive of a self-registering thermometer, registering on a fillet of paper, with a pricking point, at intervals as short as fifteen minutes if desired.

REGISTERING THERMOMETER. BY JAMES LEWIS, MOHAWK, N. Y.

The apparatus, for convenience of description, may be divided into three parts.

First. The Thermometer, consisting of a bundle of iron and brass wires (No. 13 wire measure), which bundle comprises, within a length of *about* 15 inches, the equivalent of about 45 inches of iron wire antagonized by an equal length of brass wire. These wires are arranged *around* a centre, instead of being placed in alternate pairs each side of a centre, for the purpose of making each individual wire contribute its share of stiffness to the stiffness of the whole bundle; also for the purpose of giving equal rigidity to the *circular plates* which connect the wires at their extremities, so as to avoid as much as possible the elasticity which is being constantly multiplied by arranging the rods at unequal distances from the centre in a straight line each side of the centre.

The whole number of rods or wires in the bundle is eleven, six of these (in three pairs) are iron, and on these the force of *compression* is exerted. The force of extension is applied to four brass wires (two pairs), arranged alternately with the iron wires around the centre, and also to a single brass wire in the centre (which single brass wire is the equivalent of a pair).

It will be seen that the above arrangement makes the first pair of iron rods form the *base* of the Thermometer, and the last (single) brass wire the terminus.

The base of the bundle of rods is secured against a proper foundation in a *pendant* position: on this foundation is placed the support for the fulcrum of a very strong lever, bearing on knife edges. The short arm of the lever is connected with the central brass wire of the bundle, and multiplies the *difference* of the rates of expansion of the two metals composing it eight times; a second lever still further repeats this five times. The long arm of the second lever, by means of a chain (made of flat links and rivets), communicates movements to a pulley resting on friction wheels, which pulley is made in two parts, one of which is eight times larger than the other (allowance being made for the semi-diameter of the chain on the smaller portion of the pulley).

A slender silk cord runs over the larger part of the pulley and sustains a delicate weight, which is guided between two slender parallel rods (brass wire No. 32 wire measure), which parallel rods are kept in tension by means of springs.

The above comprehends the essential features of the Thermometer. All the parts should be constructed with as much nicety of adjustment as a fine watch, and with the exception of the two metals in the rods, and perhaps the knife edges and shafts or pivots of the friction wheels, the whole work should be of brass, of a uniform quality and temper as near

(Continued on page 316.)

(Continued from page 296.)

as practicable. The first lever should be very strong and light, and for this purpose may be made of skeleton form, of considerable lateral dimensions, or rather *vertical*, the lever being in a horizontal position and acting vertically. The second lever and pulley are very delicate and slender.

The position of the pulley, as above arranged, enables me to place a dial over it, with an index attached to the projecting shaft of the pulley.

One solid plate of metal (brass) forms the support and union of all the parts sustaining the rods, levers, and pulley. The lower extremity of the *parallel rods* being held by springs, may not necessarily have a continuous metallic support from the other parts.

The second part of the apparatus does not require the nice mechanical precision of the first part; its purpose being merely to record the indications of the Thermometer.

The recording portion of the apparatus consists of a train of cylinders carrying a fillet of paper, the axes of the cylinders being parallel with the parallel wires which guide the registering point of the Thermometer.

One of these cylinders presents the surface of the paper to the registering point, which passes very near, but not in contact with it, the movements of the registering point being across the paper. A series of *levers* and *springs*, which cannot be well described without diagrams, gives the proper "feed" to the cylinders and paper. But as this part of the apparatus is susceptible of an endless variety of modifications, it is unnecessary to speak of it further.

Connected with the cylinders is a hammer, made with reference to the *width* of the fillet of paper. This hammer imparts the necessary force to the registering point to make a small hole in the paper fillet, and is, when not in action, held from contact with the registering point by means of a recoil spring, which spring is adjustable by means of a screw. The levers connected with the feed of the cylinders are operated by the back movement of the hammer.

The third part of the apparatus consists of a common marine clock, with jewelled movement, to secure its action in cold weather. In practice, it will be necessary to have clock movements constructed with special reference to the number of records it is desired to obtain. A common thirty-hour clock, in order to have the necessary power to move the *hammer*, requires to have each alternate pin removed from the wheel that actuates the hammer lever; the lever requires, also, to be modified so as to accommodate the change. This change, if quarter-hourly records be required, will make it necessary to re-wind the clock too often.

My apparatus has the striking part of a clock constructed to move both the time and striking trains, as the equivalent of the *striking part* of one clock; the whole service of the spring being turned upon the striking train—the time train being removed, its space being occupied by the necessary levers. A marine clock, with time movement only, imparts the *time* to the striking part, very much as in any ordinary clock, except that the shaft of the minute wheel has *four* projections instead of one, so that I can obtain records four times each hour. A peculiar arrangement, difficult of description, enables me to change the rates from quarter-hour to half-hour, or hour movements of the hammer.

In describing the Thermometer, I omitted to mention that the lower end of the central brass wire in the bundle of compensated rods, was furnished with an adjusting screw, by means of which the index and registering point may be adjusted to any desirable point.

My fillet of paper is 2¾ inches wide. This enables me to obtain a range of nearly 50° without shifting the position of the registering point. In a trial of one week I have not found any occasion to readjust the index and registering point. I have much difficulty, however, in the *scale* of my apparatus, and this arises from using a mercurial thermometer as a standard of comparison, the tube of which is probably unequal in its dimensions in various parts, and the scale not corrected to correspond. At first, I constructed my scale from temperatures —10° to +80°, about 164° on my dial. Subsequent comparisons show that between 30° and 40° of the

Mercurial Thermometer, 10 of the Mercurial Thermometer correspond to 9 of my dial. I have, therefore, no dependence on the mercurial instrument I have, especially as no ten degrees of the two instruments will agree, except the 10 on which a correction is made, although they agree over a long range at extremities.

In presenting this account of my apparatus, I *desire* that a knowledge of it may be made widely public, for the benefit of those scientific men who may appreciate it, and desire to use a similar apparatus constructed under their own supervision. The details of all the parts are susceptible of numerous modifications. I have not so much devoted my attention to the *best* arrangement of *all* the parts, but have confined my efforts more particularly to perfecting the *Thermometer* in that form which will make it most reliable and least susceptible of improvement. The *rods* are on the outside of the case which incloses the dial, registering apparatus, and clock. The apparatus is very sensitive. The rods move the index freely to ¼ degree, and the ticking of the clock attached imparts just enough vibration to overcome resistance to a very minute fraction of a degree. Indeed, on watching the index while a slight change of temperature occurs, the index may be seen to advance or recede with the tickings of the clock, almost creating the impression that they are only parts of one movement.

Yours, JAMES LEWIS.

Pending nomination, No. 397 was read.

Dr. Wm. Harris, from the committee appointed to procure a portrait of Judge Kane, reported it finished and in the hall of the Society, and presented the bill for painting, framing, &c., which was ordered to be paid.

And the Society adjourned.